

TAXONOMIC AND DISTRIBUTIONAL NOTES ON SOME FUNGUS-FEEDING NORTH AMERICAN *DROSOPHILA* (DIPTERA, DROSOPHILIDAE)¹

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ABSTRACT: Comparison of type specimens and examination of variation in natural populations indicates *Drosophila ordinaria* Coquillett, *D. melanderi* Sturtevant, and *D. magnafumosa* Stalker and Spencer to be synonymous species designations. *Drosophila recens*, previously known only from northern states, is reported to be present in the Great Smoky Mts., Tennessee. The known distribution of *D. chagrinensis* is also extended, with the report of a specimen collected in Ithaca, New York.

During recent studies of fungus-feeding Drosophilidae in eastern North America, it became apparent that three species names, *Drosophila ordinaria*, *D. melanderi* and *D. magnafumosa*, might be synonymous. Below are the formal synonymy, a discussion of the evidence which led to this taxonomic revision, and a more complete description of the species. Also given are notes extending the known distributions of *Drosophila recens*, and *D. chagrinensis*. Extensive lists of the host fungi of the mycophagous drosophilid fauna of eastern North America will be published later in papers dealing with the ecology of these flies.

Drosophila ordinaria

Drosophila ordinaria Coquillett 1904, Proc. Ent. Soc. Wash. 6:190, female. Type locality: White Mountains, New Hampshire. Type in USNM.

Drosophila melanderi Sturtevant, 1916, Ann. Ent. Soc. Amer. 9:337, female type and paratype. Type locality: Tacoma, Washington State. Type in USNM. *Syn. nov.*

Drosophila magnafumosa Stalker and Spencer, 1939, Ann. Ent. Soc. Amer. 32:112, male. Type locality: Great Smoky Mountains National Park, Tennessee. Type in USNM. *Syn. nov.*

BASIS FOR THE SYNONYMY. The lack of characteristics for clearly distinguishing among flies of the *melanderi* group and the possible synonymy of the American species has been noted in the past by Marshall R. Wheeler (personal communication to Peter F. Brussard). The published differences are slight, and are fully encompassed by the range of variability within populations that I have sampled in Tompkins County, New York and the Great Smoky Mountains, Tennessee. A study was therefore undertaken to compare specimens of *ordinaria*, *melanderi*, and *magnafumosa* for all morphological characters commonly used in *Drosophila* taxonomy. The

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type specimen of *magnafumosa* was kindly loaned by Harrison Stalker; specimens of larval, pupal and adult *melanderi* from Trinidad, California were supplied by Herman Spieth; the type and other specimens of *melanderi* and the type of *ordinaria* were made available by Don Davis of the USNM. No consistent differences were noted among these flies or the collections I made in New York and Tennessee. Some eggs, larvae and pupae were obtained during attempts to establish stocks of New York and Tennessee flies. Comparison with the *melanderi* larvae and pupae from California revealed no differences in mouth hook structure, puparium color or size, or spiracle morphology. Egg filaments appeared identical in the Tennessee and New York populations.

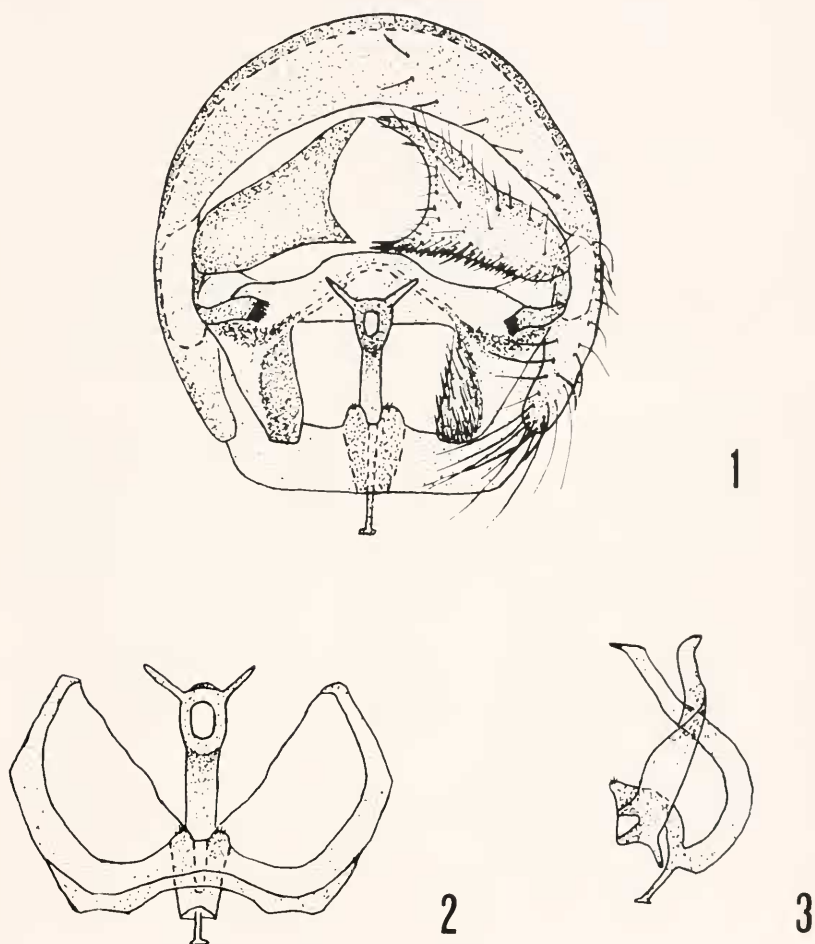
Drosophila ordinaria was known previously only from female specimens, while *magnafumosa* was described from a male specimen. Perhaps this hindered earlier attempts to verify the synonymy. *Ordinaria*-like females and *magnafumosa*-like males have been reared in my lab from single wild-caught females. Breeding tests comparing *melanderi* with the other forms have not been possible due to a lack of success in maintaining, for more than one generation, cultures from flies collected in New York and Tennessee. Spieth (pers. comm. to Peter F. Brussard) was similarly unsuccessful in retaining a culture of *melanderi* from California.

Preparations of the external male genitalia have been made from specimens collected in Tennessee, from specimens collected in New York, and from Spieth's specimens from California. The male genital region is found no differences in the genital morphology of flies from the different populations. Hsu (1949), however, illustrated differences in the male genitalia of *melanderi* and *magnafumosa*. *Melanderi* was shown as having two large teeth at the corner of the anal plate, while *magnafumosa* was stated as lacking these teeth. All specimens that I have examined, whether from Tennessee, New York or California, have the two larger bristles as shown in Hsu's figure of *melanderi* and in Fig. 1 of this paper. Hsu also stated that *melanderi* has 10 teeth on the secondary clasper (the stalked structure with a row of short, closely spaced teeth in Fig. 1), while *magnafumosa* has only seven. Each specimen I examined clearly has 8 teeth in the row.

Drosophila ordinaria

Female. Arista with about 5 branches above and one below, in addition to the terminal fork. Head and antennae brownish yellow. Front over one-third width of head. Only one prominent oral bristle (the vibrissa). Cheeks brownish yellow, their greatest width one-fourth the greatest diameter of the eyes. Eyes with sparse blond pile. Second orbital one-third size of the other two.

Acrostichal hairs in six rows. Anterior dorsocentrals close to posterior dorsocentrals. Mesonotum, scutellum, pleurae and legs brownish yellow. Mesonotum with a median darker stripe. Anterior scutellars parallel to divergent. Apical and preapical bristles on first and second tibia, preapicals on third.



Figures 1-3. Male genitalia of *Drosophila ordinaria* Coquillett. Specimen from Ithaca, N.Y. 1. The entire copulatory apparatus in semiventral view. 2. The penis apparatus in ventral view. 3. The penis apparatus in lateral view.

Abdomen brownish yellow. Each segment with a dark brown posterior band, widely interrupted medially. Banding widens to fill out lateral areas.

Wings clear. Only one large bristle at distal costal break. Costal index about 2.9; fourth vein index about 1.4; 5x index about 1.4; 4c index about 0.8. Heavy bristles on basal two-fifths of third costal section.

Length body 2.8 mm; wing 3.0 mm.

Male. Genital region dark brown and conspicuous. Thorax somewhat darker than in females. Abdominal banding darker and reaching closer to anterior edge of segments.

Egg. 0.6 mm long. Four filaments, each about 1/2 the length of the egg.

Puparium. Each anterior spiracle with about six branches, without definite stalk.

Distribution. Tacoma, Washington (A.L. Melander); Mt. Constitution, Washington (A.L. Melander); Trinidad, California (H.T. Spieth); Montana, Minnesota (these two states listed by Strickberger, 1962, as being in the known geographic range of *melanderi*); St. John's Co., Quebec (C.W. Johnson); White Mountains, New Hampshire (H.K. Morrison, type material); Chester, Massachusetts (C.W. Johnson); Ithaca, New York, elevation 1050 ft. (R.C. Lacy); Six-Mile Creek, Dryden-Caroline, New York, elev. 1370 ft. (R.C. Lacy); Great Smoky Mountains National Park, Tennessee, elev. 4000 ft. (W.P. Spencer); Great Smoky Mountains National Park, Tennessee: elev. 4500 ft., Cosby Creek; Clingman's Dome Road, elev. 6000 ft., Walker Prong, elev. 3150 ft., Husky Brook, elev. 2550 ft., Elkmont area, elev. 2100 ft., LeConte Creek, 1600 ft., Little Pigeon River, elev. 1550 ft. (R.C. Lacy). Specimens from New York and Tennessee have been deposited in the USNM and the Cornell University collections.

The species seems to be distributed across the northern United States, into southeastern Canada, and down the Appalachian Mountains. In the Smoky Mts. *ordinaria* is quite rare below 3000 feet, but common at the higher elevations where the climate and vegetation resemble that found in the more northerly part of its range. Other primarily northern *Drosophila*, *D. athabasca* Sturtevant and Dobzhansky, *D. algonquin* Sturtevant and Dobzhansky (both in the *affinis* species group), and *D. recens* (see below) show similar patterns of distribution in the eastern United States.

The *melanderi* species group, which also contains several Palearctic species, *D. makinoi* Okada in Japan, and *D. cameraria* Haliday in Europe, Iran, Azores, Madeira and Canary Islands, should perhaps now be labelled as the *ordinaria* species group.

Drosophila ordinaria have been raised from 16 genera of Basidiomycete fungi collected in New York and Tennessee, including all species of fleshy fungi that were reasonably well sampled.

EXTENSION OF THE KNOWN RANGES OF *DROSOPHILA RECENS* AND *D. CHAGRINENSIS*

Drosophila recens Wheeler has been reported to be a rare species of the *quinaria* species group, distributed from New England, across the northern United States and southern Canada, as far west as North Dakota. I here report that *recens* is a fairly common mycophagous fly in the Great Smoky Mountains, Tennessee. I collected many specimens in July and August of 1979 and 1980, at the sites listed above for *ordinaria*. Like *ordinaria*, *recens* is found primarily at the higher elevations, above 3000 feet.

Drosophila chagrinensis Stalker and Spencer is a quite rare species of the subgenus *Hirtodrosophila*, only a few specimens of which have been reported from Ohio, Wisconsin and Iowa (Strickberger, 1962). In September 1980 I reared a single female *chagrinensis* from a jelly fungus (*Tremella* sp.) that was collected along Six-Mile Creek, Dryden-Caroline, New York, elev. 1370 ft.

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BOOKS RECEIVED AND BRIEFLY NOTED

FLIES OF THE NEARCTIC REGION. Graham C.D. Griffiths, ed. 1980. E. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Stuttgart. Available in USA from Lubrecht & Cramer, RFD 1, Box 227, Monticello, N.Y. 12701.

A new series of definitive reference works intended to be a counterpart to the Palaearctic series. This new series is planned to consolidate the achievements of No. American dipterology during the present century and provide a sound basis for continuing progress during the next. It is hoped the work can be completed by the year 2000.

FLIES OF THE NEARCTIC REGION, Vol. I, Part 1. HISTORY OF NEARCTIC DIPTEROLOGY. Alan Stone. 1980. 62 pp. \$38.80.

A very appropriate and interesting handbook to introduce the new series. Section headings include: 1. Introduction, 2. Major Entomological Publications (a review), 3. History of the Families of Diptera, (with references cited), 4. The Generic Names of Meigen, and 5. Some Leading Specialists, containing brief biographical sketches of 56 authors who have proposed more than 100 names for Nearctic Diptera. (with references cited).

FLIES OF THE NEARCTIC REGION, Vol. V, Part 13. BOMBYLIIDAE. No. 1. Jack C. Hall & Neil L. Evenhuis. 1980. 96 pp. \$44.40

This No. 1 volume deals entirely with a systematic review of the genus *Bombylius*, with a key to nearctic species.